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much entitled to recognition as those whose origin we do not happen to know.—CHARLES E. BESSEY.

Prillieux's Diseases of Plants.²—Among recent contributions to botanical literature is the first volume of a work on the diseases of agricultural plants including forest and fruit trees by Ed. Prillieux, Professor in the ("Institut National Agronomique," Paris). The work is the outcome of the author's twenty years study and teaching of Economic Vegetable Pathology.

In the introduction the change in the methods of viewing plant diseases is referred to. Instead of trying to trace an analogy between human pathology and phytopathology, plant diseases came to be regarded as due to changes of normal physiological functions produced either by unfavorable conditions or by the action of parasitic organisms penetrating the tissues. The placing of phytopathology on a more rational basis is attributed to De Candolle.³ In this connection Unger⁴ might well have been cited.

The author next speaks of the aims and purposes of the work. He says: "If I am able to render the study interesting and intelligible to agriculturists and to all persons living in the country who have received some general knowledge of the structure of plants, I shall have obtained the end I have in view."

In speaking of the difficulties of studying minute parasitic plants he adds: "It seems to be established that such researches present too many difficulties to be carried on by any one who wishes. My greatest desire is to dissipate this belief and to facilitate the beginnings of observers who, living in the country, are able to test on cultivated plants the facts already observed and described, and to examine the parasites in quantity in all their stages of development. If they acquire a taste for these researches they may be able in their turn to add many new facts to science." We believe the many acute investigators who after thorough equipment have spent years in trying to solve some of the problems presented by plant diseases will not think us pessimistic if we venture to predict that the author's hopes regarding the contributions to the life histories of parasitic fungi which he expects from the novice will not be realized. If, however, he succeeds in getting the intelligent farmers to observe carefully the parasitic plants

² Prillieux, Ed. *Maladies des Plantes Agricoles et des Arbres fruitiers et Forestiers causées par des parasites végétaux*. Home Premier, Paris, 1895.

³ De Candolle, Aug.-Pyr. *Physiologie Végétale*. Paris, 1832.

⁴ Unger, Franz. *Die Exantheme der Pflanzen*. Wien, 1833.

which destroy their crops, and to study and become familiar with the facts that have already been established by investigators he will have rendered an incalculable service. He next refers to the diverse forms and various stages in the life histories of many disease-producing parasites and the necessity of knowing all the facts connected with the conditions of their propagation and growth, and the importance of this knowledge as a basis in devising means of preventing or combatting them. It seems to us he might well have urged in addition the need of a comprehensive knowledge of the complex physiological activities of plants under normal conditions, as this must be the basis for an understanding of abnormal or pathological conditions, and must precede any rational treatment of such conditions.

The remainder of the introduction is devoted to detailed directions for the use of the microscope. These directions are intended for beginners, and cover the simple manipulations of the instrument as used in the elementary study of plant histology.

The various parasites of which the volume treats are arranged in systematic order. The first part treats of "Cryptogamic Parasites other than Fungi." These are discussed in two chapters, one on Bacteria and one on Myxomycetes. The second part treats of "Parasitic Fungi," to which five chapters are devoted in the following order: Phycomycetes, Ustilagineæ, Uradineæ, Basidiomycetes and Ascomycetes. The style is rather concise and exact, though not so technical as to make the work forbidding or unintelligible to the non-scientific reader. The numerous figures, though in many cases crude, give a fair idea of the general characters of the object represented. It would seem that in a work intended for the use of agriculturists and horticulturists more attention might profitably have been given to the treatment of the diseases discussed. There can be no doubt, however, of the usefulness of the work, and if the class for whom it is especially intended can be prevailed upon to use it, it will assist greatly in popularizing and advancing a branch of botany which is at present in its infancy, but which is destined to great growth in the near future.

C. L. SHEAR.

Campbell's Mosses and Ferns.⁵—This book has appeared at a most opportune time in the history of botanical science, if, indeed, a long-wished for book can ever fail to be opportune. The Archegonia-

⁵ *The Structure and Development of the Mosses and Ferns* (Archegoniatae), by Douglas Houghton Campbell, Ph. D., Professor of Botany in the Leland Stanford Junior University. Macmillan and Company, London and New York, 544 pp., 8vo